

Proficiency test for trace elements and uranium isotopes in water
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ช่วงเวลาดำเนินการ ปี พ.ศ. 2558 - 2559

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รายละเอียดสรุป

A study on the determination of ^{235}U from powder samples using Gamma Spectrometry to rudimentary estimates of nuclear materials by non-destructive technique for control and regulation in terms of safeguards and nuclear forensics. The research was carried out by using the samples from by-products of monazite processing as an in-house standard. The samples were collected for chemical composition analysis from the annual safeguards inspection in 2012. The destructive techniques were used to analyze ^{235}U by Inductively Coupled Plasma Spectrometry (ICP-MS) and UV/VIS Spectrophotometer and used these results for conducting research. The in-house standard was prepared as a calibration curve by dilution with boric acid in various concentrations and measured the spectra at 185.7 keV by using Gamma Spectrometry. This energy overlaps with ^{226}Ra at 186.21 keV and must correct the self-absorption by measuring each sample together with the ^{226}Ra standard. The accuracy of the method was verified against the results obtained by Inductively Coupled Plasma Spectrometry (ICP-MS) and UV/VIS Spectrophotometer. The results indicate that no significant difference between Gamma Spectrometry and other techniques at a 95% confidence level. This in-house standard calibration curve can be used as a pattern of ^{235}U in other powder samples for elementary estimation by using Gamma Spectrometry as a non-destructive method.